Knills no 3

~~5 30 c 30~~
~~6~~

THE DESCRIPTION OF A MICROSCOPE FOR *Opake Objects*;

As Made and Sold by

JOHN CUFF,

At the Sign of the *Reflecting Microſcope* directly againſt *Serjeant's-Inn* Gate, in *Fleet-ſtreet, London.*

PEOPLE curious in Microſcopical Obſervations, have frequently lamented the great Difficulty of examining *Opake Objects* with any conſiderable Degree of Exactneſs or Satisfaction; for, in all the Contrivances they had met with to that Purpoſe, as the Object muſt be brought to the Focus of the Magnifier, in order to take a View thereof, the Nearneſs of the Inſtrument neceſſarily intercepted the Light from falling on it, and in ſuch a Manner overſhadowed it, as to render its Appearance obſcure and undiſtinct. And notwithſtanding Means were tried to caſt Light upon the Object, from the Sun or a Candle, by a Convex Glaſs placed on the Side thereof, the Rays from either could be thrown upon it, in ſuch an acute Angle only, as ſerved to give a confuſed Glare, but were inſufficient to afford a clear and perfect View of the Object.

But

But an effectual Way has been happily found out to remedy this Inconvenience; and that is, by fixing a Double-convex Lens, or Magnifier, in the Center of a Concave Speculum, whoſe Focus is near the ſame as the Focus of the ſaid Lens; whereby a ſtrong Light is reflected directly upon the Object, and every Part thereof may be examined with the utmoſt Exactneſs and Delight.

The following *Apparatus* (whoſe chief Parts are of Braſs or Silver) has been contrived for the better making uſe of the ſaid Invention.

Through the firſt Side A, paſſes a fine Screw B, the other End whereof is faſtened to the moveable Side C.

D. Is a Nut adapted to the ſaid Screw, by the turning of which the two Sides AC are gradually brought together.

E. Is a Spring of Steel that ſeparates the ſaid two Sides, when the Nut is unſcrewed.

F. A Piece of Braſs turning round in a Socket, whence proceeds a ſmall Spring Tube moving upon a Rivet, through which Tube there runs a Steel Wire, one End whereof terminates in a ſharp Point G, and the other hath a Pair of Plyers H faſten'd to it. — The Point and Plyers are to thruſt into, or take up and hold any Inſect or Object; and either of them may be turned upwards, as may be moſt convenient.

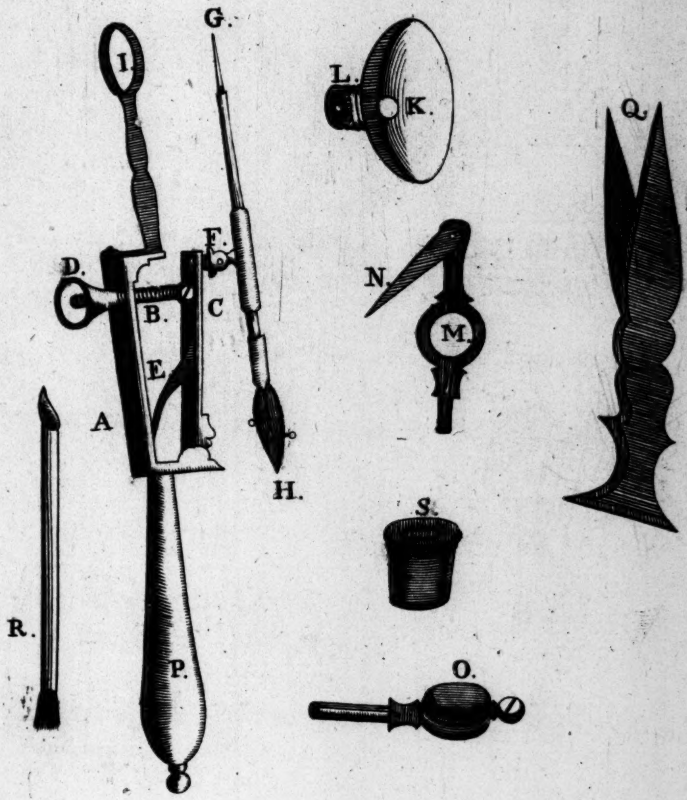
I. A Ring of Braſs, with a Female Screw within it, mounted on an upright Piece of the ſame Metal, which turns round on a Rivet, that it may be ſet at a due Diſtance when the leaſt Magnifiers are uſed.

This Ring receives the Screws of all the Magnifiers.

K. A Concave Speculum of Silver, very highly poliſh'd, in the Center of which a Double-convex Lens is placed, with proper Apertures to look through it. On the Back of this Speculum a Male Screw L is

fitted

7



[illegible] 5

[illegible]

fitted to the Braſs Ring I, to ſcrew into the ſaid Ring at Pleaſure.

There are four of theſe Concave Specula, of different Depths, adapted to four Glaſſes of different magnifying Powers, which are to be made uſe of as different Kinds of Objects may require. Obſerve, the greateſt Magnifiers are known by having the leaſt Apertures.

M. A round Object Plate, one Side white and the other black, intended to render Objects the more viſible, by placing them, if black, on the white, and if white on the black Side. A Steel Spring N turns down on each Side, to make any Object faſt, and at one End of the Object Plate is a hollow Pipe to ſcrew it on the Needle's Point G.

O. A ſmall Box of Braſs, with a Glaſs on each Side, contriv'd to confine any living Object, in order to examine it: This alſo has a Pipe to ſcrew upon the End of the Needle G.

P. A turned Handle of Wood to ſcrew into the Inſtrument when it is made Uſe of.

Q. A Pair of Braſs Plyers to take up any Object, or manage it with Conveniency.

R. A ſoft Hair Bruſh for the taking up a Drop of any Liquid, and applying it to the Iſinglaſs, to view the Animacula.

S. A ſmall Ivory Box for Talks to be placed occaſionally in the ſmall Braſs Box O.

When you would view any Object, ſcrew the Speculum with the Magnifier you intend to uſe, into the Braſs Ring I; place your Object either on the Needle G, in the Plyers H, on the Object Plate M, or in the Braſs hollow Box O, as may be moſt convenient according to the Nature of it; then holding up your Inſtrument by the Handle P, look againſt the Light thro' the magnifying Lens, and by Means of the Nut D, together with the Motion of the Needle by managing its lower End, the Object may be turned about, raiſed, or depreſſed, brought nearer the Glaſs, or put farther from it, till you hit the true focal Diſtance, and the Light be reflected from the Speculum ſtrongly upon the Object, by which Means it will be ſhewn in a Manner ſurpriſingly diſtinct and clear. And for this Purpoſe, the Light of the Sky, Sun-ſhine, or a Candle, will anſwer to your Satisfaction.

This *Microſcope* is principally intended for *Opake Objects*, but tranſparent ones may alſo eaſily be view'd by it, obſerving only, that when ſuch come under Examination, it will not always be proper to throw on them the Light reflected from the Speculum; for the Light tranſmitted through them, meeting the reflected Light, may together produce too great a Glare. A little Practice will teach how to regulate theſe two Lights to good Advantage.

There is Reaſon to expect great Diſcoveries may be made by the *Apparatus* above deſcrib'd. The famous Mr *Leewenhoek*, in all his Obſervations, uſed only ſuch ſingle Glaſſes, placed ſomewhat in the ſame Manner, but without the Advantage of our reflected Light, as is evident from his own Accounts, and alſo from twenty-ſix of them, given as a Legacy to the *Royal-Society*: And, in a Letter to the ſaid Society, he declares, his having found, in a long Courſe of Experience, "that the moſt conſiderable Diſcoveries were to be "made with ſuch Glaſſes, as, though magnifying but "moderately, exhibit the Object with the moſt perfect "Brightneſs and Diſtinction.